TBS INC.

THE BOTTOM SHELF, INC.

LIBRARY 100

LEVEL II TRS - 80 SOFTWARE
(100 PROGRAMS)

L I M I T E D   W A R R A N T Y

The Bottom Shelf warrants that for a period of
ninety days from the date of receipt by the customer
that the product purchased will be free of defects
in material and workmanship under normal use and
service. This warranty shall be void if any abuse
or unnatural damage has occurred, or if the recording
medium has been recorded on by other than The
Bottom Shelf. The customer's sole and exclusive
remedy in the event of any defect is expressly
limited to replacement of the item upon presentation
to The Bottom Shelf at its office. No representation
by another shall be, or deemed to be, a representa-
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and test the program contained herein, and run
the system in parallel with existing procedures
or compare results with a known standard for a
period of time sufficient to insure that the results
of the computer operation produce satisfactory
and accurate data and computations.

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TBS INC

Dear Friends:

Thank you for purchasing the Library 100. We hope you will enjoy our programming.

The Library 100 was designed with you in mind. It is terrible to own a $700 to $4,000 computer and have it sitting idle because it isn't programmed to be useful. The Libray 100 was created to fill this need.

While TBS Inc. will be providing other software in the future and continuing the volume sales pricing method, we felt it was imperitive to provide you with a basic software library as soon as possible. Our business is serving you. As you notice, we said a basic software libary. The Library 100 is not intended to meet all of your software needs. Instead it is intended as an introduction into the excitement of computers. We hope you will get many ideas for future uses for the computer from the Library 100.

The Library 100 will not be offered in Level I Basic. We did not feel we could provide you with an adequate level of quality considering the limitations of the level I language.

Much of our planned future software will require at least one disk unit and 32K of memory (L print modes will be available). We hope to lead the field in providing applications Software for the TRS-80.

We are currently involved in Semi-Custom Software manufacture. By Semi-Custom Software we mean that we are doing individual applications programming. But only when we see a national market for the Software. Consistant with our policy of giving the customer the best possible bargain, we are giving the original applications software purchaser a limited 10 percent royalty on the software we develop for him and market nationally. Consistant with our policy of quality, we will not accept projects we feel we cannot properly do on the TRS-80 or ones that we feel are not consistant with the highest programming standards.

Once again we Thank You for your purchase and hope you enjoy using the Library 100 as much as we enjoyed creating it for you.

Sincerely

THE BOTTOM SHELF, INC.

Officers & Staff

TAPE #1

Business and Finance

Side 1-A (16K)

Page	Location	Title		File Name
4-5	16	Finance 1	(A-J)	A
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4-5	23	Present Value of Future Sum	A
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4-5	85	Amortization Schedule	D
4-5	106	Interest Rate-Compound Interest	E
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4-5	173	Term of Installment Loan	H
4-5	198	Present Value of Series of Payments	I
4-5	221	Real Estate Investment Analysis	J
4-6	270	Nominal-Effective Interest	K
4-6	289	Internal Rate of Return	L
4-6	305	Future Value-Regular Deposits	M
4-6	323	Regular Deposits-Future Value	N
4-6	338	Depreciation-Amount	O
4-6	354	-Rate	P
4-6	369	-Salvage Value	Q
4-6	384	-Schedule	R
4-6	401	Bond-Present Value	S
4-6	416	Bond-Yield to Maturity	T
7	431	Sale-Cost-Martin-Day of Week	U
7-8	454	Moving Ad	V

TAPE #2

Education

Page	Location	Title		File Name
11-12	18	Add		A
12	49	Subtract		B
12	79	Multiply/Divide		C
12-13	105	Fractions/Decimals		D
13	134	Base Numbers		E
9 -12	156	Eduquiz	(16K)	F
14-18	269	Pilot	(16K)	+ Pilot
14-18	302	Pilot	(4K)	+ Pilot

TAPE #3

Graphics

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19	14	Front Cover	A
20	51	Wierd	B
20	65	Ratrace	C
20	78	Random Ad	D
19	96	Fireside	E
19	109	Left Right	F
19	126	Blocks	G
21	141	Herring	H
21	152	Launch	I
21	166	Blinker	J
21	177	Snoopy	K
21	201	Snow	L
21	213	Step Ad	M
20	226	Step Ad 2	N
21	240	Graphic	O
--	252	War Game *GAME*	P
31-34	286	Star Trek	Q
37	377	Speedy	R
36	392	Life	S
37	411	Court	T
37	433	Road Race	U
36	448	Fifteen	V

TAPE #4

Home

Page	Location	Title	File Name
27-28	15	Bartender	A
27	85	Nutrition	B
27	148	Conversion	C
28	189	Calendar	D
23	210	Base Conversion	E
22	225	Calculator	F
24	278	Vacation	G
24	255	Tele Code	H
22	278	Message Center	I
24	295	Night Checkoff	J
23	305	Expense	K
22	322	Baby Sitter	L
26	349	Drunkometer	M
25-26	365	Remember	N
25	391	Xmas List	O
26	432	Mileage	P

TAPE #5

Games

Page	Location	Title	File Name
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	63	Search	S
	87	Memory Letters	M
	115	Sting Ray	S
	148	Russian Roullette	R
	176	Wheel of Fortune	W
	204	Towers	T
	231	Decision	D
	253	Memory Numbers	M
	277	Doomsday	D
	310	Sketch	S
	331	Flipper	F
	346	Stars	S
	362	Odd One	O
	389	Spy Ship	S
	409	Horse	H
	426	Scissors	S
	447	Craps	C
	471	Star Blazer	S
	493	Tiger Shark	T
	510	Unjumble	U
	522	Mind Reader	M
	535	Roach Race	R
	547	Jumble 2	J
	567	Gypsy	G

BUSINESS & FINANCE

As with any series or system of business or finance programs, do not rely on any of the following programs until they have proved accurate in your particular application. This can only be done by running them in parallel with your operation for a length of time sufficient to show the accuracy of each operation contained in the program. There are a number of items which may make the following programs show slightly different results from your current methods, or methods used by others upon which you rely. For instance all programs contained in the LIBRARY 100 use an interest rate based on 365 days per year; most banks will figure interest on a 360 day year. Further, several of the programs in the LIBRARY 100 use fractional cents as payments on installment loans, when, in fact, these fractional cents, of course, cannot be made in practice. This is of particular concern in amortization schedules, and the very last payment is often used as an "adjusting" payment. The figures for the bond programs may not match exactly what you see in your daily newspaper, as those results are calculated using various conventions which in themselves produce inaccuracies. All programs, except the Real Estate Capital Investment Program, use single precision variables, and thus will be accurate to a maximum of six (6) significant digits. This was done in the interest of speed of operation, as six (6) significant digits suffice for almost all of the uses to which these programs should be put. Again, use these programs in parrellel with your existing methods until they appear to be sufficiently accurate for your use.

For you 16K folks, finance programs are menued on Side A of tape number 1. For you 4K folks, the finance programs are broken down into individual programs on Side B.

In most of the financial programs sufficient instructio exist to both explain the program and request the proper data to be entered. Carefully read the question asked, and answer it exactly as instructed. For instance, in Program Number One, of the first Finance Program, which calculates the Present Value of a Future Sum, you are requested to state the future sum in dollars.

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Do not enter a dollar sign, merely the number. The same goes for the second question which asks for the annual interest rate in %. Please note that you are asked for the annual interest rate, not the interest rate for any one particular interest period. The next question asks you to enter the number of periods in one year. This would be the number of interest periods, normally monthly, which would be twelve periods in one year. The last question necessary for computation is the total number of periods to be calculated. This must be the number of periods, for instance a loan to be compounded monthly for ten years, the number of periods would be 120.

For a few of the problems, the parameters are restricted somewhat. For instance, in the amortization schedule (Program 4 of the first finance menu) the compounding rate of the loan must be in months, as is indicated in the request for information.

In a few programs, such as the Interest Rate-Compound Interest or Days Between Dates, you are asked for a formatted entry on a date (month, day, year). The format is given, and should be followed exactly. Do not forget commas. Commas are required.

The largest program in the first section is Number 10, the Real Estate Capital Investment Analysis. A great deal of information is needed for completion of this program, which should be obtainable from your broker, seller, or accountant. The information needed is as follows:

1) Purchase price of property
2) Vacancy allowance, in %
3) Number of units in the property
4) Square feet of usable space in property
5) Anticipated gross income
6) Expected expense ratio (expenses/actual income) in %
7) The term of each mortgage, in months
8) The annual interest rate of each mortgage, in %
9) Depreciation allocation to building, in %
10) Depreciation allocation to personal property, in %
11) Method of depreciation for building
12) Term of building depreciation for building, in years
13) Method of depreciation for personal property
14) Term of depreciation for personal property, in years

Finance Two

1) The nominal interest rate is the rate usually quoted by financial institutions for loans, and is only correct if the loan is paid back at the end of the first payment period. If the loan is continued for a period of one year, the interest due at the end of each period is added to the principal and compounded, and interest is charged on that interest, this raises the effective interest rate·at the end of the one year period. For instance, (work through this one) a future value of $119.56, a present value of $100.00, a total number of periods of 12, at twelve (12) periods per year, gives you a computed nominal rate of 17.9986%, and an effective rate of 19.56%. This is the standard 18% per year (revolving charge) type account carried by many department stores. The difference between the nominal rate shown by the computer and the 18% is due to the fact that a computed future value at exactly 18% is about $119.563. We ignored the fractional cent. This program is useful in figuring the interest on your credit cards.

2) Internal rate of return. This program figures the present value of the sales price of an earning investment and the present value of these earnings of that investment, subtracts the purchase price of the investment. The rate of return is returned by the computer in percent (%), and the effect of your investment may be easily measured against the return on a more standard investment, or against your standards. This type program is used commonly in business to determine whether a particular investment should be made.

3 & 4) These programs are the corrolary of the loan programs used in Finance One. A deposit is known as an annuity due, where the payment is made at the beginning of the earning period, such as deposits in a bank account. A regular annuity has payments at the end of the earning period, such as a loan from a bank. Be sure you get the proper program for your use.

5, 6, 7 & 8) Compute various methods of depreciation for you. In Program 8, a depreciation factor is called for and described within the program instructions. If you don't know what the other depreciation methods are, you probably want straight-line depreciation. Prior to using the other methods, an accountant's advice is called for.

9) This program determines the present value of a coupon bond, according to your desired interest rate, and returns the present value which will produce that particular interest rate.

10) Program 10 performs the converse of Program 9, and will determine the current yield to maturity, at a given price, returned on the screen in %, given a particular purchase price of a bond.

FINANCE THREE

Consists of five programs, the first three of which
are closely related for merchants and others de-
siring repetitive use of a sale-cost-margin programs.
These are set up for repetitive use, so that large
numbers of items may be calculated simply. The
fourth program gives you the day of the week for
any date (Gregorian). The date format is required
as indicated, including using all digits for the
year, i.e., December 7, 1941 is: 12,7,1941. Don't
forget the commas!

MOVING ADVERTISEMENT

The moving advertisement package is designed to max-
imize the graphic capabilities of the TRS-80 and
allow you to have an intrigueing television bill-
board. Radio Shack dealers take note.

This program allows you to enter ten static (non-mov-
ing) advertisements and ten moving advertisments
into your computer and store them on tape. There
are ten sections to this program in the 16K version.
Once you have designed and entered your group of
messages the computer will display randomly two mov-
ing and two static (non-moving) advertisements on
the screen. The messages will be resident on the
screen for three cycles of the longest of the two
moving adds being used at that time at which time
the computer will select two more static advertisements
and two more moving advertisments. This program
will be of major use to computer owners that have
businesses with large amounts of walk-in traffic.

IMPORTANT--You must enter at least two static (non-
moving) and two moving advertisements.

When you run this program the first question that
will be asked is whether the program was loaded from
disk. Answer this questions with yes or no. After
you enter your answer a menu will appear on the screen.
Number one is make "entries to the file-static."
This subprogram allows you to enter messages that
are of a non-moving type. Your message should be
no more than five lines in length. Be sure to format
your message so that it looks right on the screen.
Do not hit enter until you have completed the message.
The cursor is positioned at the far left side of
the screen. Start entering your message until you
have completed what looks right on the first line.
Then space to the beginning of the next line. Do
not hit enter. You may then continue your message.
When the message looks right on the screen it will
be correct for you to enter it into the file.

The second subcategory is make "entries to the file-moving." When entering your messages to the moving ad section, continue typing until your message is completed. Do not worry about the format on the screen, and do not hit enter until you have completed your message.

Subcategory three is "record entries." This subprogram will ask you to place a blank tape in the recorder and the recorder in the record mode. Be sure this is completed before pressing enter. Record the entries you have made in the other files to tape.

"Load entries." This subprogram will allow you to load your previous tapes containing the data for your moving and static adds. The subprogram will ask you to place your data tape in the recorder and the recorder in the play mode. Do not press enter until these steps are accomplished.

"Edit entries-static," and "edit entries-moving." You may edit existing records by entering the edit mode. The program will display your previous entries and allow you to make corrections. When you make a correction you must correct the entire entry. If you type anything, it will replace the entire message. In order to exit the edit mode, you must press enter until the program leaves the edit mode. You may not leave the edit function by entering a shift Z as you were able to do in making entries to the file.

"Add static entries" and "add moving entries." These subprograms will allow you to enter additional entries to the file. Each time you make an additional entry you must go back into the add mode that you wish to use. The subprogram will allow you to enter one entry and then will return you to the menu. This function is extremely useful in that you can load a previous data tape then add another entry. For instance, today's special sale.

"Display Add." This functions allows you to display your advertisements. Merely press 9, then press enter and the files you have already constructed will be used for your advertisement. If at any time you wish to return to the menu, press Shift Z; and you will be returned to the moving advertisement function menu.

EDUCATION

The Bottom Shelf, Inc. has taken the approach to educa-
tion of attempting to make learning as natural and as
much fun as possible. To accomplish this we have in-
corporated what we consider to be a high degree of flexi-
bility into our programming.

SUBJECT PROGRAMMING - EDUQUIZ SECTION

The eduquiz section is a group of ten interactive pro-
grams which allow the operator to choose from one of
ten subjects and then on any of the ten subjects per-
form a drill, a multiple choice examination, a true-false
examination, a matching examination or a fill-in-the-
blank examination. The subjects are (1) states and
capitals (2) states and date of entry to the union (3)
states and order of entry to the union (4) states and
abbreviation (5) states and largest city (6) inventors
and inventions (7) world capitals and country (8) urban
areas and their population rank (source - World Almanac)
(9) authors and their books (10) Presidents and their
rank order. All ten subjects are displayed on the screen.
The operator has the choice of selecting one of the
ten subjects by entering the number to the left of the
subject. The programs then give a second menu indicat-
ing at the top the subject, for instance, states and
capitals and gives the operator six choices (1) drill
(2) multiple choice (3) true-false (4) matching (5)
fill-in-the-blank (6) return to subject menu. The opera-
tor then selects the number of his choice.

Drill

The drill routine proceeds down the file first display-
ing the information then asking a question about the
information with the information displayed. A sample
is: Alabama's capital is Montgomery. The question is,
"Montgomery is the capital of ..." The operator then
types in "Alabama" and presses enter. The drill will
not proceed until the right answer is entered or option-
ally you may type help which will end the drill. The
information is then wiped off the screen and another
question is asked. In this case "Alabama's capital
is ...", the operator is required to type in "Montgom-
ery". The program will then say right and proceed to
the next question or wrong and return to the previous
question. The drill routine is useful in learning the
information in the first place, whereas, the other quiz-
zes are primarily useful in testing and supplimentary
learning on a subject. In order to exit from the drill
the operator must either go through the entire subject
data file or type help. At the completion of the drill
the operator's score will be given in numbers right
and numbers wrong. The program will then go to another

menu giving the operator the option of redoing the drill, returning to the quiz menu and selecting another quiz mechanism on the same subject or returning to the subject menu.

MULTIPLE CHOICE

When the multiple choice option is selected the programmer will first prompt, "How many questions do you want?" As the multiple choice section will not give you the same question twice. The program will not allow you to enter a number of questions larger than the total amount of information in the data file on that subject. If you do ask for too many questions it will ask you again, "How many questions do you want?" Once you have selected how many questions you desire the program will ask you whether you want questions on one of the two related categories or random questions. For example, if you chose the subject states and capitals you would have the selection of questions on states, on capitals or random. A sample question of states would be, "Baton Rouge is the capital of ...?" An example of capitals would be, "Nebraska's capital is ...?" Random would randomly select the patterns asking some questions, asking for the states and some questions asking for the capitals.

During the multiple choice examination you may discontinue by typing in eleven. This will allow you to exit from the multiple choice examination. At the completion of the multiple choice examination your score will be given in numbers of answers right and numbers wrong and a menu to choose from which allows you to redo the previous quiz, return to the quiz menu or return to the subject menu.

TRUE-FALSE

After selecting a true-false quiz you will be asked the number of questions that you desire. The true-false quiz will randomly make statements such as, "Nashville is the capital of Kentucky" or "Kentucky's capital is Frankfort". You are required to enter 1 for true or 2 for false. The computer will immediately tell you whether you are right or wrong. Upon completion of the test the computer will automatically exit the true-false mode and tell you how many answers you got right and how many answers you got wrong and give you the options of redoing the previous quiz, returning to the quiz menu or returning to the subject menu.

MATCHING

If you select the matching quiz the program will randomly select items from each of the two associated cate-

gories, i.e. states and capitals, and place them in random order in two columns. The computer will then prompt you to select a number from one of the categories, i.e. enter the number of your choice from the category states. You then have the choice of any of the ten subjects in that category. The computer will then prompt you and ask you to enter the number of your choice from the second category, i.e. from the category capitals. If you wish to change your entry for the first category merely press enter on the second category. The screen will then be reformatted and you will be asked to enter your choice from the first category. Upon making a selection the program will first tell you whether you are right or wrong and show you the right combination. The screen will then be reformatted with your choice from the first category absent and the subject that matches your first choice absent. At any point you can exit the matching quiz by entering eleven as the number of your choice from either category. Upon completion of the quiz, either by entering eleven or by doing all of the problems, you will be given your score and the choice of redoing the previous quiz, returning to the quiz menu or returning to the subject menu.

FILL-IN-THE-BLANK

Warning. This is the most difficult of all the quiz mechanisms. Do not use the fill-in-the-blank until you know the topic well. This will help avoid lost pride. The fill-in-the-blank section will first ask you a question. You must fill in the answer using exact spelling. If you miss the question, you will be given the right answer, told you are wrong and be required to fill out the right answer. The program will not proceed until the right answer is entered. At any point you can exit the fill-in-the-blank quiz by typing help. Upon completion of the fill-in-the-blank, either by typing help or completing the number of problems you originally specified, you will be given the number of answers you got right, the number of answers you got wrong and the choice of redoing the previous quiz, returning to the quiz menu or returning to the subject menu.

All the problems in the Eduquiz section are done by random selection. You will not get the same questions in the same order on any of the quizzes except the drill.

ADDITION

The addition program is designed for almost all skill levels. You are first asked to enter your name and your level from 1 to 10, 1 being a low level and 10 being the highest. All the questions in the addition

quiz are randomly selected. Entries are taken from
right to left just as you would add up a column of fig-
ures using a pencil and paper. This is in reverse of
the way you would normally enter figures into a calcu-
lator or computer. In order to make corrections on
what you enter press the arrow which points to the right
on your keyboard. When you have entered your answer
the program will evaluate your answer and tell you im-
mediately if you are right or wrong. If you are right
a star will appear on the right side every time you
complete a correct entry. If you are wrong the program
will tell you that you are wrong and tell you what the
right answer was. At the completion of ten problems
the program will tell you how many you got right and
how many you got wrong, then give you the options of
playing another game at the same level, playing another
game at another level or letting a new player play the
game. Warning. The higher levels of addition are ex-
tremely difficult. You may get problems with as many
as ten four-digit numbers.

SUBTRACTION

Subtraction is similar to the addition program with
the exception that it quizzes you on subtraction instead
of addition.

MULTIPLICATION AND DIVISION

This program drills a person on the multiplication and
division tables up to twelve. You have the choice of
doing either multiplication or division and the choice
of one of five levels of difficulty. The multiplica-
tion drill will give you multiplication problems five
to a screen, two screens worth for a total of ten pro-
blems. It will then give you your score. After each
problem it will tell you whether you are right or wrong
and if you are wrong what the correct answer was. If
you are right it will place a star on the right side
of the screen. At the completion of the program you
will be told what your score was. Division uses a for-
matted screen, giving you one problem at a time on the
screen. All problems will require only an even number
entry. If you get the problem right you will be told
that you are right and a star will appear on the right
side of the screen. If you get it wrong you will be
told that you are wrong and what the correct answer
was.

FRACTIONS

This program will quiz you on either the conversion
of fractions decimals or of the conversion of decimals
to fractions. The program has four levels of expertise,

beginner, average, good or great. After choosing your
level you have a choice of converting fractions to de-
cimals or converting decimals to fractions. On convert-
ing fractions to decimals, the fractions should be round-
ed to three places, i.e. 2/3 = .667.

If you get a problem wrong it will tell you that you
are wrong and give you the correct answer. If you are
right it will tell you that you are right and give you
a star on the right hand side of the display. On com-
pletion of ten problems it will tell you how many right
and how many wrong you got. On converting decimals
to fractions you will be given a decimal number and
be asked to enter the fraction on a formatted screen.
If you get your answer right it will tell you that you
are right and give you a star on the right hand side
of the screen, if you are wrong it will tell you that
you are wrong and give you the correct answer. At the
completion of ten problems it will tell you how many
you got right and how many you got wrong.

BASENUM

The Basenum program is designed to give you training
in the art of conversion of numbers from one base
to another. The program is extremely flexible and
allows you to have questions asked in any base or
give the answers in any base. The program will first
ask you what base you want the problems in. You
have a choice of bases from 2 to 32. The program
will then ask you what number base you want to use
for the answers. The program will then ask you what
level you wish to choose. You have the choice of
Level 1, which is up to the decimal number 10. Lev-
el 2, which is up to the decimal number 100, Level
3 which is up to the decimal number 500, Level 4
which is up to the decimal number 1000, or Level
5 which is up to the decimal number 64,000. Once
you have entered your choice of levels, the program
will give you ten random problems in the number base
you chose, using numbers which are equivilant in
decimal, too, up to the highest number in the level
you chose. You are expected to respond with answers
in the number base that you originally chose. After
you have completed ten problems the program will give
you your score.

Tiny PILOT

Education through the use of computers is now a "fact of life". Computers affect our day to day lives in so many ways that it is only logical that they be put to use in the education field, not only for educating people in the uses of computers, but educating people with computers. Out of the need for CAI, Computer Aided Instruction, a nontechnical, noncomputer specialist language was required, thus "PILOT" was born. This is short for Programmed Inquiry, Learning Or Teaching. Several PILOTs have been written, but before the advent of inexpensive microprocessors these were only available to the large educational institutions with the finances to afford a mainframe machine to run these PILOT programs. Now, for the first time, computers are available to a wide group of people for commercial and personal use. CAI can be brought into the home, the place where education begins.

The Bottom Shelf, recognizing the need for a PILOT home use, and utilizing the TRS-80, a powerful, well-proven and inexpensive microprocessor, has developed Tiny PILOT (TPILOT). This PILOT is an interpretive language, that is, TPILOT is a machine code program that interprets PILOT command statements and performs some action based on the command. There are a total of ten TPILOT commands available, but it only requires three "core" commands to write a PILOT program. These are commands that are straight forward and easy to use. By reading the instruction outline and studying the sample programs provided, a child can be programming PILOTs within a matter of minutes. The three core commands are:

```
T:for type a text line
A:for accept answer from the keyboard
M:for match data string with answer previously
  typed in
```

Also, the command E:is used to terminate the program.

An example of the simple PILOT program would be as follows:

```
T:What is the capital of France?
A:
M:Paris
TY:Right
TN:Wrong
E: ↑
```

"A":accepts the answer the user keys in.

"M":matches the known answer against what was entered.

"TY":causes the following text to be displayed only if there is a match.

"TN":causes the following statement to be displayed only if there is not a match.

Other commands are added to provide flexibility in programming, such as the counter commands which may be used to construct program controlled "loops" or answer "scoring" functions.

Two versions are offered for the TRS-80 Level II, a 4K and 16K version. The only differences between the two are memory capacities. The 4K version will handle 5 labels and 24 64-byte statements; the 16K version handles 100 labels and 200 64-byte statements.

See page 2/4 of the Level II Manual for instructions on loading under the SYSTEM command. Use the title TPILOT to start the loading procedure.

Upon loading TPILOT through the SYSTEM command, the user is given the option of either keying in the PILOT command statements or loading a previously stored program from a cassette. On termination, the user may save the PILOT program on cassette if he desires. At the present time a text editor is not available for TPILOT, but one is being developed by The Bottom Shelf and will be released shortly.

Tiny PILOT is only the beginning of our efforts in the PILOT field. Future editors will have many "bells and whistles" added. However, the current program will provide you functional programs without a major effort to "learn a new language". All efforts will be made to make future PILOTs compatible so that the programs you make now will run as the expanded versions. Send us comments on enhancements you would like to see.

SAMPLE TINY PILOT PROGRAMS

#1   T:What is the capital of France?

    A:

    M:Paris

    TY:Right

    TN:Wrong

    E:↑

#2   T:Enter a vowel

```
A:

M:A, E, I, O, U

TY:Correct

TN:Incorrect

E: ↑


#3    T:The next command statement

      T:Will clear the screen

      C:

      T:This statement will appear on line 1

      E: ↑


#4    T:We will now perform a "jump" command

      J:@Here@

      T:This statement will be bypassed

      @Here@T:This is the next line to displayed

      E:↑


#5    I:This is a comment statement.  It is "I"gnored

      Z:H

      @Loop@T:This line will appear 16 times

      B:H

      X:H=016

      C:

      JN:@Loop@

      E: ↑


#6    Z:H

      Z:I

      T:Enter a vowel
```

```
@Ask@A:

M:A, E, I, O, U

BY:H

B:I

X:I=005

TN:Name another

JN:@Ask@

X:H=005

TY:Good!   5 in a row!!

TN:Not too good.   You didn't get all 5

E:
```

TPILOT INSTRUCTION SUMMARY

COMMAND SYMBOL	NAME	FORMAT	
T	type	(@label@)T:	(text)
A	ask	" A:	
M	match	" M:	string 1, string 2, ... string n
J	jump	" J:	@label@
Z	zero counter	" Z:	[H,I,J,K]
B	bump counter	" B:	[H,I,J,K]
X	examine counter	" X:	[H,I,J,K] [=<>]x
C	clear screen	" C:	
I	ignore text	" I:	(comment text)
E	end	" E:	↑

Legend

X	000 to 255 (must be 3 digits)
[]	choose on entry
()	optional
↑	up arrow key
@label@	1 to 6 alpha numeric characters
text	ASCII character string excluding "@" and ":"

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This section is designed to show you the graphics capa-
bilities of your TRS-80. While many of the programs
are merely light and entertaining, the others may be
used for advertisements. The main intent of this pro-
gramming section is to put the TRS-80 through its gra-
phic display paces.

FRONT PAGE

Front Page is our advertisement. We hope it will talk
you into telling your friends about our product. We
have done our best to provide the best bargain in soft-
ware history. For your friends sakes as well as ours,
please advise them of the quality and quantity of our
programming. Since its advertising, we didn't count
it in the 100.

LEFT-RIGHT ADVERTISEMENT

This program will allow you to create a moving ad that
moves across your screen from left to right. You will
first be asked to enter a nonmoving advertisement and
you will then be asked to enter a moving advertisement.
The nonmoving advertisements can have multiple lines
by your positioning the ad. The imput is in the thirty-
two character wide format and when you are completed
with the first line, continue spacing the cursor until
you line it up under the first letter of the first line.
When your nonmoving message is displayed it will then
have multiple lines which start at the left column.
The nonmoving message can be up to 200 characters long.
Do not worry about how it looks on the screen in imput.
Do not hit the enter key until you are completed with
the message. The display will move a message from the
left to the right. As it approaches the right side
of the screen it will subtract characters to the left
to place in the next word of the message.

BLOCKS

Blocks is a graphics display that draws a series of
blocks on the screen. The blocks are randomly placed
and random sized. When 25 blocks are placed on the
screen, the screen will be cleared and process will
be repeated.

FIRESIDE

Fireside will let the computer do its own thing. It
will draw random designs on the screen from right to
left, left to right, top to bottom, bottom to top, ran-
domly clearing them out and randomly completing drawings.

Many of our customers have spent hours watching the display. It is truly unusual.

STEP AD TWO

Step ad two is another advertising program. It allows you to enter message of up to 250 characters in length and it will display the message in a stair step manner. At any point you can change the message by pressing (shift) Z. Do not be concerned about the format of the message as you enter it. Continue typing until the message is complete before pressing enter. This program takes your sentence, divides it into individual words, prints the word, drops down one line, then prints the next word. At the completion of the sentence the screen will advance forward and the stair step will begin on the left again. If the message is long enough to continue to the far right side of the screen the next word will appear on the left side of the screen.

RANDOM AD

This program will allow you to print a message on the screen. The message will be flashed on the screen one word at a time and in a random location on the screen. The screen is then cleared, pauses for a second and prints the next word in the message. At any point you can enter a new message by pressing (shift) Z. Do not press enter until completing your entire message. The message can be up to 250 characters in length.

WEIRD

Weird is a weird program. Call it up and watch it in operation. Random graphic characters randomly move across the screen. A graphic extravaganza, fun at parties or entertaining viewing when television is boring. Merely run the program and the program will do its own thing.

RAT RACE

Tired of the rat race? Computerize it. Rat race allows you to put a short message on the screen and combines advertisement and graphics. First, you enter your message (just press enter if you don't want a message) and the computer will do its version of a rat race. Up, down, back and forth. Which way will it go? A little star runs around the screen leaving periods behind it. Just when it has gone just about every place, the screen and it starts all over again.

GRAPHIC WORDS

Graphic words allows you to enter a message which it will then divide into individual letters which will move up the screen, moving inward from the two corners or outward from the center. Try it. You'll like it. The message can be up to 250 characters in length. Do not hit enter until the message is complete.

LAUNCH

Launch is another advertising mechanism. It allows you to enter a message which will be displayed on the screen one word at a time. Starting from left to right each letter in the word will be launched to the top of the screen. When the last letter is launched to the top of the screen, the next word will replace it and the process will be repeated until the end of the message. Messages should be limited to 255 characters.

RED BARON'S ENEMY

Red Baron's enemy draws our canine super hero in full battle gear as his dog house receives aerial hits. He issues his proclamation, "Curse you Red Baron." Regular and reverse video used.

BLINKER

Blinker is another advertising mechanism. It allows you to place one nonblinking message on the screen and one blinking message on the screen. Each message is limited to 250 characters in length.

HERRING

Herring draws an interesting pattern on the screen. Watch it in action. That's the only way to describe it.

SNOW

Snow allows you to enter a letter or character and watch it "snow" on the screen. The program will also accept full words such as; names, etc. However, it causes overlap and the program was designed for using one character entries.

STEP AD

Step ad is the last of the advertising mechanisms. It is a different mechanism for entering a stair message across the screen. The message is limited to 255 characters in length.

HOME SECTION

The home section was designed to provide some useful functions for the computer in the home environment.

It was particularly difficult to provide useful programming for our home environment without printer and disk units. Many functions such as the Christmas list, mileage, expense account, calculator and others would be greatly enhanced if programmed for a disk unit. However, these programs were designed for the TRS-80 Level II with some emphasis on 16K Memory and tape storage as most TRS-80 users do not have the additional peripherals yet.

DRUNKOMETER

The drunkometer, tests reaction time and averages the results of three reaction tests. These results are compared against the levels okay, so so, tipsy, high and drunk. Using a formatted screen, the program prompts you on your mark, get set and go. The time between the prompts is a random variable. The reaction time is then "metered". When you complete three reaction tests the results are averaged and your reactions applied against the scale.

This test is not to be considered a valid test of alcoholic consumption level; however, if you score poorly on the drunkometer it would be adviseable to have a friend do the driving.

NIGHT CHECK-OFF LIST

The night check-off list uses a formatted screen in order to prompt you, or the children, in preparation for retiring each evening. When you press the number of the item being checked off it will be erased from the screen. Pressing invalid keys or pressing the key for an item already checked off will result in a message indicating that you should try the right keys. Upon completion of the check-off list, the program automatically terminates and prompts you to turn off the computer for the evening.

VACATION CHECK-OFF LIST

The vacation check-off list uses a formatted screen to aid you in preparation for departure on a vacation. Once you complete an item press the key corresponding to that item, the item will then be deleted from the screen. Pressing inappropriate keys or pressing the key for an item already checked off will result in a message indicating that the key used was inproper. Upon completion of the check-off list the computer

BABY SITTER

The baby sitter program allows you to post instructions for your baby sitter, save them on tape, load them back in, make corrections or make additions to them. The program provides one screen of emergency numbers and on the next screen provides special instructions which you create. At the bottom of each screen the baby sitter is instructed to either press any key for notes or press any key for instructions for emergency numbers. The screens will change when any key is pressed. You have the option of making alterations to the instructions by using the edit mode or displaying your instructions and returning to the menu by pressing shift Z. You will then be returned to the menu. The menu consists of enter entries to the file, edit entries, record entries, load entries and display. The program prompts you through entering the name of the family physician, his telephone number, the name of a relative, the relative's relationship, the relative's phone number, the name of a neighbor, the neighbor's phone number, phone number of the fire department, the phone number of the police department and the phone number of the ambulance service. It then asks you to enter the number of your rule and then the rule or note. Continuations of a rule or note can be made by not entering a rule number. By using the edit mode you can change the telephone numbers or the titles of the telephone numbers. For instance, you can change the title and phone number for ambulance service to the title for the poison control center and its phone number. The program can best be used by creating a tape entry which would have the telephone numbers and a few specific rules or notes. You can then enter the edit mode and add your evenings itinerary and a phone number where you may be reached.

CALCULATOR

Calculator allows you to use your computer as a calculator. You have eleven functions available to you: add, subtract, multiply, divide, change signs, memory, clear and replace with value, memory plus total, memory plus value, recall memory to value, clear memory and percent. The program asks you to enter your initial value, it then asks for your function. If your function needs a second value it asks you for the second value. For instance, the problem 23 x 46 = ? would ask you to enter the initial value, enter the function and enter the second value. The functions are resident on the screen at all times and upon completion of a function the total of your previous operation is carried to the initial value so that you can do long calculations easily.

prompts you to secure and turn off the computer.

EXPENSE ACCOUNT

Expense account is a great aid to executives or sales-
men who must fill out expense accounts. The program
starts on Sunday and prompts you through entries for
fares, lodging, breakfast, lunch, dinner, entertainment,
other tips, tolls, local transportation, telephone and
communications, other expenses, gas, wash or mileage
and storage. It then gives you the total for each day.
At the end of the week it sums up the totals for each
category and gives you a total expenditure for the week.

MESSAGE BOARD

The message board allows you to use your computer as
an attention getting message board. No longer will
members of your family be able to say they did not get
the message or did not find the note when the message
board program is used. The message board program first
asks you for the name of the person to whom the message
is directed. It then asks for the message. It then
asks if there is a second message and repeats the pro-
cess. The names will appear in the upper left hand
corner and the middle of the screen. Depending upon
what you enter below the names, one or two messages
will appear. The messages will move across the screen
in a 32 character wide format and in a manner similar
to a Time Square moving lights billboard. In order
to change any message all you have to do is press any
key on the board, a menu will then appear from which
you can select to change the first message, change the
second message, return to the present message or change
both messages. If you elect not to make changes, select
choice number three and the previous messages will re-
appear.

TELECODE

Telecode is a program that allows you to find words
that are associated with your telephone number, friends
telephone numbers or special numbers that you want to
remember. The numbers two through nine on your tele-
phone have three letters assigned to each of them.
This program will randomly place one of the three letters
associated with your telephone number while maintaining
your telephone number sequence. By entering the tele-
phone number and watching the screen you will probably
find some words that are associated with the numbers.
After entering your telephone number you can press any
key to pause the display. You then have the choice
of continuing by pressing enter or entering a new tele-
phone number by pressing S then enter.

CHRISTMAS LIST

The Christmäs card list is a versatile program that
allows you to create a name and address file. The pro-
gram was designed primarily for Christmas cards but
can be used for other functions as well. The program
starts by giving you a menu allowing you to read a tape,
write a tape, enter or edit the file, search a file
for a specific entry, display a file or sort a file.
To enter or edit a record you press the corresponding
key to enter/edit and you are then prompted asking whe-
ther you want to edit an existing file or make a new
entry to the file. If you choose to enter records,
you will receive a formatted screen stating last name,
first name, street address, city, state, zip code, phone
number, comments and miscellaneous. At the base of
the screen you will be prompted into making your entries.
When you press enter the entry will appear in the prop-
er position on the formatted screen. If you choose
to go into the edit mode you will be asked which record
number you want to edit and editing will start at that
point. You will be prompted, using the same type of
formatted screen, into making corrections only in a
section which you wish to alter. For instance, if the
last name is Jones in the edited record you will see
at the base of the screen the prior entry item. If
you press the @ sign key the old record will remain
and you will be prompted on the next item, however,
you may make an entry by typing in a new last name,
for instance, Smith and pressing the enter key. This
will substitute Smith for Jones. Upon completing an
entry you are given the option of canceling the entire
entry by pressing the clear button or recording the
data by pressing the enter button. You will then be
prompted that if there are no more entries press the
up arrow and you will exit the enter/edit mode and re-
turn to the menu. The search file mode will give you
all the categories: last name, first name, street ad-
dress, city, state, zip code, phone, comments and mis-
cellaneous and ask you which category you wish to use.
It will ask you for the item sought, for instance, you
might search for the last name of Jones, it will then
give you the item numbers which match with Jones. You
can then enter the record number and get a complete
display of that file. Display file asks you whether
you wish to display starting at what record. If you
don't choose a specific record it will start at record
number one. It will then display the name, last name
first, and the comments field for a series of ten en-
tries. You then have the capability of paging forward
or back, returning to the menu or displaying a specific
record. To display a specific record choose its record
number, press the appropriate keys and press enter.
The record will then be displayed. You can then either
press enter to page to the next record, press the @ key

to return to the file display or press the clear button
to return to the menu. Sort. This subprogram will
also allow you to sort the file by any one of nine cate-
gories. You first press the key for sort. It will
then ask you to choose what category: last name, first
name, street address, city, state, zip code, phone num-
ber, comments or miscellaneous. All you have to do
is choose the category and the sort will proceed. Upon
completion of the sort it will return you to the menu.
At that point your file is reorganized and renumbered
in ascending sequence for that category.

MILEAGE

Mileage allows you to keep track of your automobile
gasoline costs. It first allows you to enter data that
you have previously entered from tape then allows you
to either make entries from the keyboard or to get the
results of the previous data. If you select to enter
your information it will ask you to first label the
trip, for instance, vacation trip 1977. It will then
ask you your starting mileage and ending mileage. It
will not accept mileages equal to each other or an end-
ing mileage that is less than the starting mileage.
It will then ask you the number of gallons used and
the total cost. You can have repeated entries under
any specific label. So you can use this as either a
mechanism to determine your costs on a specific trip
or maintain a running log on your automobiles. When
you are finished entering it will display each entry
in your file with its label in the sequence that you
have entered it. For each entry it will give the per-
iod, miles, gallons used, cost, miles per gallon, cost
per mile and the cost per gallon. You can then press
the total key and get a summary of all costs giving
the grand total for all periods. You then have the
option of selecting to review your previous figures,
add more entries or write the data to tape. This pro-
gram is ideal for the multiple car families because
they can keep separate tape logs for each car or lable
and combine them. The program is limited to 50 name
files.

REMEMBER

This program will aide members of the family in learn-
ing important telephone numbers and information. You
can create your own data file of the family physician,
his telephone number, a relative, relationship, phone
number, neighbor, his phone number, fire department,
police department, ambulance, etc. Then record these
entries or load previous entries. The program will
then give the operator a randomly selected fill-in-the-
blank test on the items entered into the data file.
While the program prompts you into entering for a

specific emergency number you can use this program to
create tests on almost any subject. You can do this
by using the edit entries mode. It will allow you to
enter whatever information you want to have members
of the family tested on.

NUTRITION

The nutrition program allows you to select various types
of foods and the portion you will use. It then will
give you the calories and carbohydrates for the foods
you selected and keep a running total of previous selec-
tions until you decide to discontinue the total. The
program contains eleven food categories: (1) milk,
cream and cheese (2) eggs (3) meat and poultry (4) fish
(5) nuts (6) vegetables (7) fruits and fruit products
(8) grain products (9) fats and oils (10) sugars and
sweets (11) miscellaneous. Within each category there
are many types of foods to choose from. This program
is a valuable tool to selecting nutritious meals.

CONVERSION

Conversion allows you the capabiliy to make conversions
from one unit of measure to another in the fields of
(1) length, (2) area, (3) volume, (4) weight avoirdu-
pois, (5) weight troy, (6) weight apothecaries, (7)
capacity liquid, (8) capacity dry and (9) temperature.
For instance, in the length category you can convert
millimeters to inches, centimeters to inches, decimeters
to inches, meters to feet, decimeters to feet, hecto-
meters to feet, kilometers to miles, inches to milli-
meters, feet to meters, yards to meters, rods to meters,
furlongs to meters and miles to kilometers. In each
of the categories you have multiple conversion factors.
For instance, did you know that 12 furlongs are equal
to 2,414.0208 meters? This is an ideal tool for engi-
neers, high school and college students.

To run the program you merely select the category first
from a display of the categories. You will then receive
a display of the functions within the categories. You
then make a selection of which of the functions you
wish to use and the computer will prompt you, for in-
stance, asking how many furlongs. When you enter your
number it will then give you the corresponding conver-
sion.

BARTENDER

While we realize that you computer owners would not
dream of consuming alcoholic beverages in the presence
of your computer, we felt that some of your guests at
parties would appreciate seeing the computer used for
a truly useful function, such as, a cocktail recipe

holder. Twenty-eight recipe titles are provided on
a single screen display. All you do is select which
one you want and it will show you the recipe. Every-
thing from an Alexander to a TBS Daytimer...take your
pick, but please not in excess.

PERPETUAL CALENDAR

Using a formatted screen this program allows you to
enter the month and the year of your choice and it will
fill out the calendar for that month. Did you ever
want to know what the month you were born in look like?
Now is your chance. Enter a two digit month number
(do not hit enter) for instance, enter 01 for January,
then enter the year you desire.

NUMBER CONVERSION

The Number Conversion program which is one of the extras
in the Library 100 allows you to enter any number up to
999,999 and the program will return the number in
whatever base you choose up to base 32.

GAMES

JUMBLE

This program gives you ten problems with words jumbled.
The letters will not be in the right sequence. It
is your task to unjumble the words. In some rare cases
two words may be made from the same group of letters.
There is, however, only one correct answer. At the
end of the program you will be given your score.

SEARCH

Search is a program designed to show you the number
crunching capability of the TRS-80. The program will
display random numbers between 1 and 300. Each time
it creates a random number it will check it against
the number 150. When it finds 150 it will then do
a statistical analysis of the search to that point.
The analysis is done in double precision. It is inter-
esting to let the computer run for 24 hours or so and
watch the results. You will be surprised how guests
are awed with this program.

MEMORY QUIZ LETTERS

This program is designed to provide entertainment while
improving your memory. The program will display seven
random letters. Depending on your level, it will dis-
play them for a short period of time or a long period
of time. Also dependent on your level, after the let-
ters disappear there will be a wait period before you
are asked to enter the numbers you saw previously.
This game may be an ego deflater at first, but watch
your memory improve as you play the game.

STING RAY

In the game Sting Ray you are the commander of the
Sol ship Sting Ray, a tactical fighter spacecraft.
The Sting Ray is armed with a null beam lance focused
30 miles forward of the ship. If you are able to place
the enemy ship at the focal point, you will destroy
it. Your enemy is the Jamand Socialist Federation
Galaxy. You are on a surprise raid warping through
their galaxy. Your mission is to destroy as many Ja-
mand craft as possible. If a Jamand craft is able
to starts its Satar drive, it will disappear and get
away. To control your vessel you use the keys J for
left, K for right, U for up, and M for down. At any
time you can return for instructions by pressing the
space bar. It is important that you learn the keys
J for left, K for right, U for up, and M for down.
These keys will be used in all of the action graphics
programs. They are designed to allow a person to make

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right-handed entries and quickly control the action
games. In some of the other games, the space bar will
be used to halt movement. Once again, remember to
use J for left, K for right, U for up, and M for down.
In this program the keys must be pressed repeatedly
in order to position the null beam at the enemy vessel's
location.

RUSSIAN ROULLETTE

Russian Roullette is an old game with disastrous conse-
quences if played using the correct instruments. This
program, however, gives you the excitement of the game
without the injurious consequences.

In this program you are holding a revolver with one
chamber loaded. After each "firing" the chamber is
spun. You hope you can spin the chamber and fire six
times without having the bullet detonate.

WHEEL OF FORTUNE

Around and around she goes, where she stops nobody
knows. Now is your chance to experience the thrills
of the Wheel of Fortune in a computerized mode. The
computer allows you to bet on both numbers and colors.
After you place your bets, the computer will display
the numbers and the associated colors. The Wheel of
Fortune can be played by up to ten players. The Com-
puter will keep track of winnings and losses of each
of the players and the house.

TOWERS

Towers is an ancient Oriental game. It allows you
to move disks from one peg to another peg. The task
is to move all of the disks from the center peg to
either the right or the left peg. To do this, you
are not allowed to place a large disk on top of a smal-
ler disk. It looks simple but it's more challenging
than you would imagine.

DECISION

In the past you made complex decisions using such un-
sophisticated means as flipping coins, throwing darts,
drawing lots, and other boring and uncouth methods.
Now you can use the powerful complexity of your full-
blown computer system in order to achieve the same
certain results. Merely enter your yes or no question.
The computer, after proper contemplation, will analyze
the question and give you your answer.

MEMORY QUIZ NUMBERS

Like Memory Quiz Letters, the program is a game designed
both to entertain you and to improve your memory.

Seven random numbers will be displayed on the screen,
and (depending on your level) they will stay on the
screen for varying periods of time. After a proper
wait the computer will ask you to repeat the numbers
you have just seen. At first it may deflate your ego,
but you will watch your memory improve.

DOOMSDAY

Who said the TRS-80 couldn't do action graphics? We
believe Doomsday will become a TRS-80 classic.
You are a commander of a Y Wing intercepter battle
cruiser. The Jamand Socialist Federation has launched
a Doomsday Satelite to destroy the Sol Federation.
As the last remaining battle cruiser, your mission
is to give one final shot at destroying the Doomsday
satelite. To do this you must pass through the Dooms-
day satelite's landing corridor and fire a high power
limited range meson beam into the hanger entry hatch.

As you approach the landing corridor, you will observe
obstacles which have been place in your path. These
obstacles have been mined. Your battle cruiser has
limited shielding but absorbs some hits (how many de-
pend on your level). At the end of the corridor some
undetectable mines are in place. As you approach the
end of the corridor, the battle cruisor controls will
become sluggish and the ship will slow down. This
is due to the automatic activation of the meson beam's
final charging mechanism. The meson beam will not
fire until you are fully charged. You may, therefore,
find it necessary to press the firing button repeatedly.
The computer will override if you delay too long in
firing. The controls are: J, which moves the ship
to the left; K, which moves the ship to the right.
The space bar which stabilizes the ship using those
controls you should attempt to avoid the obstacles
within the corridor. At the end of the tunnel when
you are in place to fire, press the Z button. You
may have to do this repeatedly in order to fire your
meson beam. Good luck. The Galaxy depends on you!

STAR TREK

Welcome to the galaxy of Star Trek! Arising in the
dim antiquity of the of the electronic computer age
(late 1960's) Star Trek is resident in some form on
most mainframe computers and probably every college
computer. The game has been written and rewritten
many times, and will probably be written many more
times as home computers become more popular.

The TBS Star Trek has been written especially for The
Bottom Shelf, and your 16K TRS-80, and has several

features not common to most Star Treks. To our know-
ledge, no other Star Trek allows you a full scale look
at the galaxy map at all times, and we believe this
to be the first "real time" Star Trek, requiring com-
mands to be entered quickly. Now, let's take a look
at it!

Load the program, type "run", wait two seconds for
the screen to appear, and freeze the screen by typing
a Shift @. (Everyplace else in this program the Shift
@ is cheating.)

The galaxy map appears on the top four lines of the
screen (which you now see as X's). The Star Trek galaxy
is an 8 x 8 grid, the top portion of which appears
on the left side of your screen and the bottom portion
of the right side of the screen. The galaxy map is
read in quadrants, being quadrants over and then quad-
rants down, so that the quadrant depicted at the upper
left corner is quadrant 1-1, and the one just to the
right of that is quadrant 2-1. As you play, use the
"scan" command. Then portions of the galaxy will change
from X's to numbers. Of the three numbers in each
quadrant report, the left number represents the number
of stars in that quadrant, the middle number the number
of star bases, and the right hand number the number
of Klingons. Thus you have a record of where the Klingons
are.

On the right hand side of the screen is a list of informa-
tion. Stardate initializes at the beginning of the
game. You have thirty stardates in which to kill all
Klingons in the galaxy and return to a starbase. Condition
is either green or red, and will be red if there is
a Klingon present in your quadrant. Energy begins
at 10,000 and decreases as you play the game. Running
out of energy in the middle of the game is considered
bad form, and causes a loss of the game. Shields protect
against Klingon phaser blasts and must be kept up.
Loss of shields will cause a loss of your phaser, and
other odd damage depending on circumstances. Torpedoes
you begin with 15 torpedoes which you may use until they
are gone, and may reload torpedoes at any starbase.
Klingons are the enemy, represented by a "K" on the
quadrant display and must be destroyed. The number
of Klingons changes for each game. Each Klingon must
be destroyed to win the game. Each command must be
made within a Time Count of 100 which is displayed
in this location. Not inputting a command at this
point costs you a Stardate, and the Stardates left
(SD left) are displayed at the lower right of the
screen and are an absolute measure of the Stardates
left in which to complete the game.

On the left side of the screen, the previous <u>course</u>
chosen is displayed, along with the <u>quadrant</u> in which
you are located and the <u>sector</u> in which the Enterprise
is located. The sector (the screen in the middle
of your screen) is read the same way as the galaxy
map from left to right then from top to bottom. The
damage report has three elements, each element of which
is measured as a reduction in the effectiveness of
either the warp, impulse, or phaser. This reduction
must be taken into account when setting levels for
these commands. The <u>drive</u> used is either warp or im-
pulse. The warp drive is expensive in terms of energy,
but cheap in terms of stardate, and must be used for
at least an eight sector move. The impulse drive is
expensive in terms of stardate, and cheap in terms
of energy. On the lower portion of the screen is the
word "computer:" where the ship's computer will prompt
the next command necessary. Your screen should now
read "type go to initialize", and to begin the game
the letters "GO" should be entered where they will appear
next the word command:" at the lower right of the screen.
This is where all entries from the keyboard will ap-
pear. The last line of the screen is reserved for
miscellaneous comments, some of which will be clear
and some not, communications from the crew, and other
oddities best left for you to discover.

Next the <u>sector screen</u> appearing in the center of your
screen is a computer representation of the command
screen as viewed by the captain of the ship, as the
entire screen is a view of his entire console complete
with readouts. On this sector screen will appear stars,
which are asterisks, star bases which are exclamation
points, Klingons, which are K's, and the Enterprise,
which is an E. Also appearing on this screen will
be Torpedoes as they are fired in salvos of five, and
the phaser energy report as viewed by theEnterprise's
sensors. As a torpedo explodes, or a Klingon is killed,
a particular sector becomes highly radioactive and
dangerous for a short period, and the Enterprise may
not enter that sector; it is then marked with (+),
and the computer will not allow that sector to be en-
tered until the radiation has decayed sufficiently.
The game is played using six priary commands, which
must be memorized. These commands are: "MOVE", "TORP",
"PHASER", "SHIELDS", "SCAN", and "DOCK". Each of the
commands initializes an entire set of moves on the
part of the crew, and prompts for subcommands will
appear on the screen. <u>Moves</u> are made by inserting
a compass rose value, that is degrees from 0 to 360,
measured clockwise, and the range measured in sectors,
one sector being the verticle or horizontal distance
between dots on the sector screen. A choice must be
made between warp or impulse power and thereafter the
move is automatic. To fire a <u>TORP</u>, the sector at which
the torp should be aimed must be given to the ship's

computer, and the routine is automatic following this.
Torps are fired in salvos of five to ensure the destruction
of anything at that location. The PHASER must be fed
a certain amount of energy. To kill a Klingon immediately
adjacent in a horizontal or vertical direction to the
Enterprise requires 200 units of energy, the phaser
power declining at a geometric rate beyond that point.

If your phaser does not kill all Klingons in the quad-
rant, the Klingons will return fire, and damage your
shields (probably, they can also do other damage on
occasion). The SHIELDS command dumps any energy remaining
in the shields back to the energy banks, whereupon
you must specify the amount to be removed from the
energy banks and placed into the shields.

The SCAN command turns on the short-range scan of the
ship and fills in the galaxy map for the quadrant in
which you are located, and each one adjacent or touching
that quadrant. This command requires no further input.
To DOCK the Enterprise it must first be placed next
to a starbase, energy must be removed from shields,
and then the word "DOCK" entered as a command. The
procedure following that is automatic as all ammunition
and energy is refilled.

arious stategies are useful in completing the game
successfully, these stategies being best discovered
by yourself as you play.

Now, type "go" and begin!

SKETCH

This game was designed to let you draw on the TRS-80
screen. We have heard of other programs which let you
draw on the screen, but not this way. Now you are
allowed to draw in either letters, words, or graphic
characters. It is best to have a graphic sheet at
hand so that you can find the position on the screen
where you wish to draw. Like the other games, Sketch
uses controls: J for left, K for right, U for up, M
for down. The letter I is used for instructions. If
you are in the automatic movement mode, the space bar
is used to stop movement. You are first asked which
character you wish to draw with. This is an important
question. You may use any of the alpha or numeric
characters with the execption of the "," or ";". This
includes spaces, questions, numbers, exclamation points,
etc. You may also use words. For instance you may
enter your name. It is best to start with a space, then
enter each letter or word, then another space. This
allows you to print independent characters or words,
and they will not show up right next to each other.
At this time, you may also enter a Shift Z. This will

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allow you access later to the graphics characters. You
may also enter a Shift D if you have already completed
a drawing. This will allow you to display your drawing
in a very unusual format. The drawing will be redrawn
in an identical manner to the way you first drew it.
It will then pause, clear the screen, and redraw your
drawing.

Once you have made your entry to the line, enter the
character you wish to draw with. You will be asked to
enter the graphic location where you want to start, from
the positions 3 to 1,020. Check the graphics work
sheet from the back of your level 2 manual in order to
locate the position where you want to start. You will
then be asked whether you want manual or automatic
character movement. If you enter 1 for manual entry,
the character you chose to work with will be drawn only
once for each time you press the U, J, K, or M buttom.
If you choose automatic character movement, the charac-
ter or word that you chose will be drawn repeatedly in
the direction you choose. If you have chosen graphic
display in the first entry, the machine will now display
play a graphic work sheet. It will show you various
arrangements of pixels with a number located to the
left of the graphics character. You will then be asked
for a graphics character number. The graphics charac-
ter number chosen will be the one that you work with until
you return and ask for another graphic character. It is
important to use the "I" button. This will return you
to the input mode, where it will ask you again to enter
the character you wish to draw with. You may then change
from graphics, a word or words, a graphics character or
a letter. If you wish to continue with the same
character, simply press enter. It will then ask you
at which graphic location you wish to start. You can
then change the location and start drawing at another
section of the screen. It will once again ask you whe-
ther you wish to draw with manual or automatic character
movement. You have the option to change your mind
again. If you don't wish to change, merely press enter.
When you press enter again your previous drawing will
be redrawn and you will be ready to continue drawing,
using the changes that you have made. When you are
ready to display your material, press "I" then enter
the character Shift D, press enter twice and you will
be in the display mode.

FLIPPER

This program allows you to flip coins in mass quantity.
After you have chosen the number of coins that you
wish to flip, you may use two different display modes
to represent the flips. In one Mode "T's" and "H's" are
used to represent the flips. They proceed across the
screen filling up lines until the number you chose is
reached. In the other mode, heads and tails are spelled
out along with the flip number. At the end of each
mode you will receive a statistical analysis of the

flipping.

LIFE

This program implements The Game of Life, created by John
Conway and described by Martin Gardner in Scientific American. The original
idea was based on the growth and decay of a colony of bacterial cells, but
the underlying forces can be found in any group of living organisms (includ
man!).

The playing field is a 40 x 40 grid, each square of which can
contain a live cell. The patterns of cells change with each generation
according to fixed rules. If a live cell has two or three living neighbors
(in the eight immediately adjacent squares), it survives to the next genera
otherwise it dies of either isolation or over-crowding. If an empty square
as exactly three neighbors, a new cell is born.

The initial pattern of cells is entered from the keyboard. To
specify a square, key in its position in the form XXYY (i.e. two digits
for the horizontal location and two digits for the vertical). To specify
a square adjacent to one just entered, you may use the appropriate arrow
key rather than typing the coordinates. The ENTER key indicates all cells
have been marked and starts the first generation.

FIFTEEN

This program is based on the puzzle of 15 numbered tiles
arranged in a square box with one empty space. Starting with the numbers
in sequence, left to right and top to bottom, the object is to form a
new pattern by sliding the tiles one at a time. Possible goals include
all odd numers at the top and even at the bottom, numeric order arranged
in a spiral, or the reverse of the starting pattern. For a real challange,
try to form the same sequence as the original pattern, but with the space
at the top left (this should be impossible, but ...).

To move a tile, type it's number followed by an arrow indicati
the direction you wish it to move (the ENTER key is not needed). The CLEAR
key will restore the original pattern.